CA2ALEV 700
A56
1972 c.1

ALBERTA LEGISLATURE LIBRARY
3 3398 00475 2134

SESSIONAL PAPER No. 550/73

SCIENCE
ADVISORY COMMITTEE

LIBRARY
VAULT 19

FIRST
ANNUAL REPORT

REPORT AND RECOMMENDATIONS

1972

TO THE
ENVIRONMENT CONSERVATION AUTHORITY
ALBERTA

Digitized by the Internet Archive
in 2024 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

SCIENCE ADVISORY COMMITTEE

FIRST ANNUAL REPORT

1972

Digitized by the Internet Archive
in 2024 with funding from
Legislative Assembly of Alberta - Alberta Legislature Library

https://archive.org/details/ableg_33398004752134

LETTER OF TRANSMITTAL

Dr. W. R. Trost,
Chairman,
Environment Conservation Authority,
9912 - 107 Street,
Edmonton, Alberta.

Dear Dr. Trost:

I hereby transmit the annual report for 1971 - 1972 of the Science Advisory Committee, a public advisory committee on environmental sciences, of the Environment Conservation Authority.

Yours sincerely,
E. E. Daniel
E. E. Daniel, Ph. D.
Chairman of the
Science Advisory Committee.

EED:cw

TABLE OF CONTENTS

SCIENCE ADVISORY COMMITTEE

INTRODUCTION....................1

ACTIVITIES TO JANUARY 1, 1973....................3

Meeting of the Science Advisory Committee - December 22, 1971....5

Joint Meeting of the Science Advisory Committee and the Environment Conservation Authority - March 7, 1972....................6

Meeting of the Science Advisory Committee - March 7, 1972........7

Joint Meeting of the Science Advisory Committee and the Environment Conservation Authority - May 11, 1972....................7

Meeting of the Science Advisory Committee - May 11, 1972.........9

Meeting of the Science Advisory Committee - November 7, 1972....10

Joint Meeting of the Science Advisory Committee and the Environment Conservation Authority - December 8, 1972..........14

Meeting of the Science Advisory Committee - December 8, 1972....15

Conclusions....................16

APPENDICES

I FUNCTION AND ORGANIZATION OF THE SCIENCE ADVISORY COMMITTEE.....19

II MOTION PASSED AT DECEMBER 22 MEETING OF SAC....................23

III RECOMMENDATIONS ON SURFACE RECLAMATION LEGISLATION IN ALBERTA...25

IV COMMENTS FROM THE SCIENCE ADVISORY COMMITTEE FOR THE ENVIRONMENT CONSERVATION AUTHORITY....................45

V LETTER TO G.W. GOVIER, DIRECTOR ENERGY RESOURCES CONSERVATION BOARD....................49

ANNUAL REPORT OF THE CHAIRMAN FOR THE ADVISORY COMMITTEE ON ENVIRONMENTAL SCIENCES - TO BE SUBMITTED TO THE ENVIRONMENT CONSERVATION AUTHORITY FOR PUBLICATION.

INTRODUCTION

The Advisory Committee on Environmental Sciences (referred to by its members as the Science Advisory Committee or SAC) has now been functioning unofficially and officially for over a year, and analysis of its goals, achievements, failures, problems and future directions is appropriate.

It is appropriate to consider first, the function and effectiveness of the Science Advisory Committee generally. Recently (Science, 1971, v. 173, p. 121) M.L. Perl published an analysis of the function of such committees in Washington, as advisors to the U.S. Government. He pointed out that they characteristically advised the executive branch of government which could keep such reports confidential and were composed mainly of scientists who belong to the "scientific establishment". He evaluated specific effectiveness ("measure of how well the system copes with its specific functions in the government") and its general effectiveness ("effectiveness of the system in relation to the general processes of making technical decisions"). He pointed out that the system is most effective in relation to limited technical questions, and least effective in relation to broad technical questions. Six of the latter were considered:

i) supersonic transport (SST)
ii) cyclamates
iii) the safety of commercial nuclear power plants
iv) the safety of underground nuclear tests
v) pesticide regulations, and
vi) herbicide use in Vietnam.

In terms of adoption of recommendations for action on the above, Perl indicated that performance of the system was very poor. He attributed this to such things as unwillingness of the executive to change its policies or to expose itself to congressional or electoral difficulties, and to the influence of pressure, and special interest groups in and out of government. Furthermore, he pointed out that the specific effectiveness of the advisory system in relation to broad technical questions is limited by:

- i) lack of effective involvement of the scientists at all the other important stages of the political decision-making process,
- ii) the confidentiality of the advice given,
- iii) the fact that, so long as reports are confidential, their existence and derivation from recognized authorities can be used to suggest any decision, whether or not contrary to the recommendations of the report, and
- iv) the process of socialization by the system so that the adviser "may fall into the trap of considering, above all else, the technique of preserving his influence in Washington". Only when scientific advisors have been willing to sacrifice their influence by stepping outside the system and releasing "confidential information" can the general effectiveness of action recommendations be restored.

Perl's conclusions have been questioned (Science, 1972, v. 176, pp. 229 and 239) but the general points he made require consideration by any science advisory committee to any government.

1) Specifically, can such a committee be effective in any sense if its reports are confidential? Even if they are not confidential, but ultimately become public knowledge through an annual report to the legislative assembly, as in the case of those of our committee; can they be effective if the release of reports follows, rather than precedes, the decision?

2) Can the composition of such a science advisory committee be chosen so that it does not represent the local "scientific establishment", and also does not represent any special interest group?

3) Can the work of the committee be arranged, and its relation to government and civil servants, so that it communicates effectively but does not fall into the trap of acting to preserve its supposed influence?

4) Can the specific effectiveness of such a committtee be evaluated by determining the input of its recommendations in government decisions?

5) Can the general effectiveness of such a committee be evaluated by determining the impact of its recommendations in the total political process of making technical decisions?

A question not discussed by Perl has also arisen:

6) Can a committee like SAC be effective without appropriate research and secretariat support, especially as the members are all unpaid, have other full time jobs, and the Committee has no agreed budget?

A number of the mechanisms worked out by SAC and the Environment Conservation Authority have the potentiality of providing affirmative answers to many of these questions. For example, appropriate involvement of SAC in public hearings would provide scientific advice without any question of confidentiality, a selection of members by broad consultation from among academic, industrial and other scientists should minimize selection problems. This report should be evaluated in relation to the answers achieved to the above questions. They will be found to be incomplete at this time.

ACTIVITIES TO JANUARY 1, 1973

The Science Advisory Committee was established unofficially at a meeting at the University of Calgary, November 19, 1971, with Dr. S.B. Smith of the Environment Conservation Authority in attendance. Attending that meeting were:

Chairman:	Dr. E.E. Daniel	Department of Pharmacology University of Alberta
	Dr. K. Aziz	Department of Chemical Engineering University of Calgary

Dr. D.A. Boag	Department of Zoology University of Alberta
Professor J.J. Bond	Boreal Institute University of Alberta
Dr. H.A. Buckmaster	Department of Physics University of Calgary
Dr. D.D. Detomasi	Faculty of Environmental Design University of Calgary
Professor P.M. Dranchuk	Dept. of Chemical and Petroleum Engineering University of Alberta
Dr. R. Kellerhals	Department of Civil Engineering University of Alberta
Dr. J. Kiujt	Department of Biological Sciences University of Lethbridge
Dr. R.P. Pharis	Department of Biology University of Calgary
Dr. L. Stebbins	Department of Biological Sciences University of Lethbridge

The other members of SAC not present at this meeting were:

Dr. S.M. Herrero	Faculty of Environmental Design University of Calgary
Professor D.R. Percy	Faculty of Law University of Alberta
Dr. E.J. Wiggins	Director Alberta Research Council

The meeting concerned itself with the questions of disposition of SAC reports (e.g., it requested clarification by the Environment Conservation Authority of its presumption "that all its reports will be tabled in the Legislative Assembly, unamended, along with the Environment Conservation Authority's Annual Report"). The questions of the responsibilities of SAC and mechanisms for choosing SAC members were also considered. The understanding of that meeting was that the committee was to be composed of academics, expert in the various disciplines related to the environment. The function of the committee in respect to public hearings, the need for a secretariat to assist in collecting and disseminating information and other matters were discussed. A small working group was struck to prepare a working paper on SAC's activities for discussion at the next meeting. Dr. E.E. Daniel was elected Chairman for one year.

MEETING OF THE SCIENCE ADVISORY COMMITTEE - DECEMBER 22, 1971

Much of the second meeting held on December 22, 1971, in Edmonton, was taken up with discussion of the working paper on the functions of SAC. Dr. S.B. Smith, and for part of the meeting, Dr. W.R. Trost and Mr. P. Babey, the other members of the Authority, attended. No information was available from the ECA on the fate of reports from SAC. After careful consideration of the working paper, a revised version was adopted, (See Appendix 1), for recommendation to the ECA.

It recommended a role for SAC in providing scientific advice to the ECA about topics considered in public hearings, and a responsibility of SAC to prepare and maintain a census of environmental problems and suggest priorities among these.

This amended proposal also recommended organization of a Steering Committee and suggested its responsibilities. Subject to approval of the ECA a Steering Committee was elected, whose membership consisted of:

Dr. E.E. Daniel - as Chairman of the Science Advisory Committee
Professor P. Dranchuk
Dr. R. Harrison
Dr. R.P. Pharis
Dr. P.J. Smith

Two documents (Appendix 11 and 111) were passed on to the ECA as the result of motions from this meeting. Also at that meeting, two ad hoc committees were struck; one, to review the materials from the public hearings on the "Environmental Effects of Strip Mining in Alberta" (Chaired by Dr. R.P. Pharis) and the other, to consider the Lake Louise Development (Chaired by Dr. S. Herrero).

On January 26, 1972, the ad hoc committee's "Recommendations on Surface Reclamation Legislation in Alberta" (Appendix 111) were submitted to the ECA after consideration and minor revision by the SAC Steering Committee. These Recommendations were released on approximately November 1, 1972, to the public, after they had been tabled in the Legislative Assembly.

The Ad Hoc Committee on the Lake Louise Hearings prepared a report to be transmitted to Cabinet. That report is included as Appendix IV. This was approved by the Committee as a whole at the March 7th meeting below, and delivered to the Authority on the same day.

JOINT MEETING OF THE SCIENCE ADVISORY COMMITTEE AND THE ENVIRONMENT CONSERVATION AUTHORITY - MARCH 7, 1972.

On March 7, 1972, a joint meeting of the Science Advisory Committee and the Environment Conservation Authority was held in Edmonton, and the subject of the responsibilities of SAC occupied most of the time. Dr. G. Miller attended at the invitation of Dr. Trost. Dr. Trost, speaking for the Authority, stressed the role of SAC in preparing and evaluating materials preliminary to a public hearing, and making presentations at a hearing. There was discussion regarding the role of SAC in setting terms of reference for and evaluating consultants' reports and of providing scientific evaluation of hearing materials, but no clear decisions were reached nor was there any definite provision of a secretariat to aid SAC.

In addition, Dr. Trost informed the joint meeting that the ECA believed SAC should consist of a mixture of academics and non-academics, the latter primarily from industry. Problems of industrial scientists were discussed with respect to possible confidentiality of materials provided by government or industry, and conflict of interest in the evaluation of hearing materials. A schedule of joint meetings for SAC and the ECA was drawn up.

MEETING OF THE SCIENCE ADVISORY COMMITTEE - MARCH 7, 1972.

At a subsequent SAC meeting, following the above joint meeting, the final draft of the statement on the Lake Louise Development was approved. There was discussion on the preparation of a final draft of a submission to the Energy Resources Conservation Board and the Cabinet on social costs associated with natural gas prices. Dr. Harrison also undertook to investigate, in a preliminary fashion, a proposal by the Medicine Hat Chamber of Commerce for diversion of water from the South Saskatchewan River.

Ad Hoc Committees were struck to deal with proposed public hearings on the Environmental Effects of the Operation of Sulphur Extraction Gas Plants (Chairman, Professor Dranchuk); Forestry Practices in the Hinton Area (Chairman, Dr. Pharis); and technical sessions relative to Pesticides, Herbicides and Hard Chemicals (Chairman, Dr. Boag).

In connection with membership on SAC, two motions were passed:

(1) "That the basic criteria for appointing SAC members should rest on their being people actively engaged in scholarly or scientific research, both applied and basic".

(2) "That the confidential memorandum to Dr. Trost would indicate the extensive discussion of the industrial membership problem that had occurred and note:

   i) There is concern that a security problem might arise with respect to confidential information, and

   ii) There is concern that individuals may have a loyalty to their company which would tend to override their use to the Committee".

JOINT MEETING OF THE SCIENCE ADVISORY COMMITTEE AND THE ENVIRONMENT CONSERVATION AUTHORITY - MAY 11, 1972.

At a joint meeting of the ECA and SAC in Calgary, May 11, 1972, the committee was officially appointed. This was announced by Dr. Trost.

Four additional members had been added by the ECA:

Mr. D. Crossley	Northwest Pulp and Power
Dr. R. Goforth	Syncrude Canada Ltd.
Dr. G. Miller	Stanley Associates Engineering Ltd.
Dr. M. Winning	Shell Canada Ltd.

Dr. Daniel continued as Chairman, and it was agreed that terms of membership should be of a three years duration, rotating one-third of the membership each year. The existing Steering Committee was confirmed, consisting of Dr. E.E. Daniel, Professor P. Dranchuk, Dr. R. Harrison, Dr. R.P. Pharis and Dr. P.J. Smith. It was agreed that SAC should take responsibility for recommending replacement of members to the ECA.

The continuing problem of secretarial services was discussed and Dr. Trost indicated that routine typing, mailing and duplication would be handled by the ECA, but that the budget allowed no provision for professional help assigned to SAC.

The possible roles of SAC at public hearings were summarized as follows:

> "That the Science Advisory Committee and its Ad Hoc Committees, with whatever additional help and consultation that the Environment Conservation Authority can provide, would prepare a position paper and issue it under the heading of the Science Advisory Committee.
>
> A second possibility is that an outside group of consultants, Government Task Forces, or other groups not associated with the Environment Conservation Authority or the Science Advisory Committee, may prepare a document on which the Science Advisory Committee might comment.
>
> The third possibility is that there may be some integration between the Science Advisory Committee and outside groups, and their respective efforts combined into one report. It would be decided at that time whose name would go on such a report."

Additional possibility was that SAC, or one of its Ad Hoc Committees would organize and conduct technical sessions. In particular, it was agreed that this should be done in connection with the hearings on the Environmental Effects of the Use of Pesticides, Herbicides and Hard Chemicals".

In addition , it was agreed that SAC would submit an annual report, and special reports from time to time.

MEETING OF THE SCIENCE ADVISORY COMMITTEE - MAY 11, 1972.

At a subsequent separate meeting of SAC, held that same day, three important motions were passed:

1. "The Chairman would arrange to have a meeting with the Minister to express SAC's grave reservations about the unrealistic nature of the schedule of public hearings in the expectations that seemed to be held of SAC in their contribution to these hearings; that SAC felt that they do have a professional, scientific contribution to make to the work of the Authority, but that there is a grave risk of this simply being buried by the sheer volume of work that is being expected of them".

2. a) "The principle is that SAC play an advisory role
   b) Two conceivable models whereby it can play that role are:
      (i) to advise a group set up by the ECA, and
      (ii) to formulate and provide direction to the holding of a technical hearing, participate in that hearing, and provide direction and advice in respect to the analysis of the results of that hearing.
   c) The Steering Committee would try to suggest, for each proposed public hearing, recommendations to SAC as to which of these models ought to be followed".

With regard to financial structure and the time element for public hearings, it was moved and passed that:

3. "The following set of guidelines be accepted as outlined:
    (i) Involvement - that the Committee take on roughly one hearing in the next twelve month period,
    (ii) Participation - any member that is interested and willing to take on more than one hearing within the next twelve months should notify the chairman. Also, where members have expertise, but cannot participate because of time limitations and priorities in respect to other hearings, that they would take the responsibility to advise the Steering Committee as to other individuals who might provide expertise and might therefore be recruited."

In addition, guidelines for membership were considered and passed on to Dr. Trost.

The letter to the Energy Resources Conservation Board regarding natural gas prices was discussed once more. This letter was given final approval and mailed on June 7th, 1972. (See Appendix V).

MEETING OF THE SCIENCE ADVISORY COMMITTEE - NOVEMBER 7, 1972.

During the interim period, between the May 11th meeting and the next meeting on November 7th, serious concern arose over the procedures for public hearings and the role of SAC's Ad Hoc Committees. These concerns originated first with regard to the Forest Utilization hearing. This hearing was postponed after considerable preliminary effort of the concerned ad hoc committee in critically evaluating the draft report of a consultant, as well as other activities. Postponement of the hearing resulted from the unexpected announcement by the Minister of Lands and Forests, the Honourable Dr. A.A. Warrack, that a study of forestry practices in the Hinton area was to be commissioned.

The second and more serious concern that arose was the failure of the ad hoc committee to be supplied with the preliminary position paper on the "Environmental Effects of Sulphur Extraction Gas Plants" (the Klemm report) in time to evaluate it and critically comment and decide on whether to make a further report to the hearings. Furthermore, the brief submitted by the Canadian Petroleum Association indicated that this organization had obtained early access to the report.

Subsequently, information was received that the report had been withheld from our committee while changes were being made by government, and that these changes were not made with the explicit approval of the author, an employee of the Research Council of Alberta.

This resulted in concern by members of the Ad Hoc Committee responsible for the technical hearings on Pesticides; that their report might be altered without their agreement. They were also concerned whether adequate funds would be available to allow them to proceed with the hearings.

These matters were the primary focus of attention at the November 7th meeting. The matter of the Klemm report was considered first. Dr. Daniel reported on a conversation he had had with the Minister of the Environment in respect to this matter. Discussion centered on: whether this was in fact a government report and subject to government revision, or whether it was the report of the Environment Conservation Authority or an individual consultant and not subject to government revision; also, the implications for the work of SAC and its Ad Hoc Committees. Dr. Trost explained that in future any Civil Servant proposing to give information to the Environment Conservation Authority and its employees or Public Advisory Committees, would have to obtain clearance from his Deputy Minister or Minister before the information was released.

The following motion was passed by SAC:

> "Future background documents of the Environment Conservation Authority should state who has the ultimate responsibility for the document, and the firm affiliated with the author or authors should be recognized".

Further, SAC agreed that the duration of the Ad Hoc Committee on the "Environmental Effects of Sulphur Extraction Gas Plants" would be extended to enable them to prepare a report considering the Klemm Report, hearing documents and material they had previously collected.

The situation with respect to activities of the Ad Hoc Committee on Forest Practices in Alberta was clarified by Dr. Pharis, and emphasis was placed on the need for early access to a consultant's report.

The problems of establishing an Ad Hoc Committee on the Eastern Slopes Hearings were discussed by Dr. S. Smith. Concern was expressed by Dr. Pharis that unless there was clear evidence of government willingness to reconsider present industrial dispositions of these lands, the hearings might appear to be pointless.

The following motion was passed:

> "Given that present industrial land dispositions (i.e. grazing, timber, oil, gas, coal, minerals, commercial recreation) cover much of Crown land and Forest Reserve on the Eastern Slopes of the Rockies, and assuming that the various Regional Planning Commission Reports will probably increase the appearance to the lay public, that even further industrial uses are contemplated by Regional Planning Groups, and assuming that the Foothills Resources Allocation Study will emphasize multiple use (including industrial use) of the majority of the acreage mentioned above, it is probable that the impression imparted to the general public will be one of a 'fait accompli'. That is, "literally every square mile is already spoken for". Because of this, a sense of pessimism may prevail, and the general tone of the hearings may become one of confrontation and acrimony.
>
> Thus, SAC recommends that the ECA prepare a carefully worded statement of some length to accompany the Foothills Resources Allocation Study, the reports of the Regional Planning Commissions, and the commercial proposals. This statement should emphasize that while little of the area in question remains free of industrial

> disposition, even in cases where dispositions have been made, changes can be made in the future upon Government recommendations. The ECA may wish to utilize the SAC Ad Hoc Committee on the Eastern Slopes for assistance in this matter, and SAC formally offers such assistance at this time."

The Committee agreed that Professors Smith and Herrero be approached to organize and serve on an Ad Hoc Committee on these hearings. (Dr. Herrero subsequently asked to be relieved of this assignment because of his other involvements with this hearing.)

Dr. Boag, Chairman of the Ad Hoc Committee on the Environmental Effects of Biocides, Pesticides and Hard Chemicals, reported on the efforts and problems of this committee. The latter concerned procedures of acquisition of information from provincial civil servants; the necessity for a consultant to prepare a summary for the proposed technical sessions; and the authority of the committee to issue the report from these sessions without modifications if it was accepted.

With regard to the last point, the following motion was passed:

> "The Science Advisory Committee accepts in principle the approach proposed by the Ad Hoc Committee on Pesticides, Herbicides, and Hard Chemicals, and the confirmation by Dr. W.R. Trost, in his letter of October 27, subject to the understanding that any supplementary material be correctly attributed in light of the previous motion, and that any abridgement be approved by the Ad Hoc Committee."

The Chairman of the Ad Hoc Committee on the Environmental Census presented its report and was requested by the Committee as a whole to prepare a final report to be presented to the Environment Conservation Authority.

There was, once again, discussion on the future role of SAC, in light of indications that the ECA, and hearings conducted by it, were increasingly viewed by the Minister of the Environment, mainly as a means to provide government with the opinions of the public, especially unstructured elements of it. Thus ECA's independence and authority were being decreased and the function of SAC under changed circumstances was considered.

Organization matters at this meeting included noting the resignations of Drs. Bond, Detomasi, Herrero and Mr. Crossley from the Committee, and the necessity to replace Dr. E.E. Daniel as Chairman in 1973.

JOINT MEETING OF THE SCIENCE ADVISORY COMMITTEE AND THE ENVIRONMENT CONSERVATION AUTHORITY - DECEMBER 8, 1972.

The final meeting of 1972 was held December 8, in Edmonton, as a joint meeting of the Science Advisory Committee and the Environment Conservation Authority. At this meeting it was agreed that, in Dr. Daniel's having completed a year as Chairman of SAC, he should step down. Dr. Pharis, and Dr. Miller agreed to serve as acting chairman and vice-chairman respectively until March 31, 1973, and this was accepted unanimously by the joint meeting. The terms of these two offices were agreed by motion to be from January 1 to December 31 each year.

Reports were heard from Chairmen of the Ad Hoc Committees for public hearings. These had to do with organizational activities of the committees.

Reporting as chairman of an Ad Hoc Committee of SAC on a Census of Environmental Problems, Dr. Boag recommended that the ECA hold hearings as soon as possible on:

1. Optimum population size and distribution in Alberta.
2. The concept of economic growth in Alberta.
3. Public responsibility for maintenance of environmental quality in Alberta.

A committee consisting of Drs. Boag, Beanlands and Daniel was struck to prepare terms of reference appropriate to a public hearing on these topics especially economic growth which might be held about 1975.

Dr. P.J. Smith agreed to serve as Chairman of an Ad Hoc Committee of SAC to consider broadening the terms of reference for proposed public hearings on the Strathcona Industrial Corridor. Additional aspects of the urban environment will be included in matters to be considered at these hearings.

MEETING OF THE SCIENCE ADVISORY COMMITTEE - DECEMBER 8, 1972.

At a subsequent meeting of SAC, the following motions were passed:

1. "The following motion be transmitted to the Environment Conservation Authority to be forwarded as soon as possible to the Minister of the Environment and the Minister of Mines and Minerals:

"It has come to the attention of the Science Advisory Committee that the January 9th, 1973, Petroleum and Natural Gas Reservation Sale includes Area 4099, most of which is essentially roadless, of some 30,720 acres, wholly within the Bow River Forest Reserve. This sale takes place approximately four months before the E.C.A.'s Land Use and Resource Development on the Eastern Slopes public hearings. If it goes forward, it will diminish the total number of land use options available for the area, namely that road and seismic trail exploration will effectively preclude the possibility of subsequent designation of wilderness recreation area. The Science Advisory Committee regrets that this "sensitive" area is being advertised for sale prior to the East Slope hearings and recommends that the Department of Mines and Minerals rejects any or all offers received, and to refund to the person making the offer monies received from them. As well, the Science Advisory Committee requests that the sale of mineral reservations within any other "sensitive" areas of the Foothills and mountains of Alberta not be allowed until input from the public hearings can be properly evaluated, and the land use policy decisions made utilizing this information".

2. "Further commitments for construction on the Kananaskis Highway be deferred until the Government has had a chance to evaluate the input from the Environment Conservation Authority's Eastern

Slopes hearings, to be held in the early part of 1973".

CONCLUSIONS

This year's activities have not provided definite answers to the questions about SAC raised in the introduction.

For example, we do not know how specifically effective we were in influencing government decisions on any matters in which we advised, and we cannot predict what impact, if any, publication of this annual report will have on the political or general decision-making process.

The problems of qualification and selection for membership in SAC and the avoidance of conflict of interest have been partially but not completely resolved.

The problems of working methods for our Ad Hoc Committees, and the collection of information from government sources have not been finally resolved though new approaches (i.e. in camera technical sessions with prior approval of presentations at a ministerial level) will be tried.

The provision of adequate secretariat services on a continuing agreed basis to deal with current and ongoing research needs has not been achieved.

Nevertheless, we have devised a technique, the Ad Hoc Committee in relation to each public hearing, that potentially could be flexible and effective in providing independent scientific and scholarly input into public hearings. To be effective, it must have the continued support and participation of dedicated independent men and women in the academic and scientific communities and the financial, secretarial and research support of the Environment Conservation Authority. The unanswered question is whether an alternate and better method of providing this input could be devised.

APPENDICES

FIRST
ANNUAL REPORT

APPENDIX I

FUNCTIONS AND ORGANIZATION OF THE SCIENCE ADVISORY COMMITTEE

The organization of the Science Advisory Committee must be such as to provide for efficient execution of its functions; hence these must be agreed first. The following are proposals considered and approved at the December 22nd meeting of the Science Advisory Committee.

1. PROPOSED FUNCTIONS:

A. Scientific Guidance to the Environment Conservation Authority in Bringing Environmental Matters to Public Hearings.

The Science Advisory Committee should, in our opinion, be involved at four stages:

1) Helping the Environment Conservation Authority define the questions to be asked and the terms of reference to consultants for preparation of reports.
2) Evaluation of consultants' reports including the data on which such a report is based.
3) Evaluation of the input received at any public hearing.
4) Preparation of a set of recommendations to the Environment Conservation Authority based upon the scientific aspects of the matter in question.

B. Preparation and Maintenance of a Census of Environmental Problems in Alberta and a Continuing Review of a List of Priorities Among These

1) Evaluation of environmental problems such as the following:
   a) Problems related to the distribution, density and activities of the human population.
   b) Problems related to utilization of agricultural land.

   c) Problems related to utilization of renewable resources.
   d) Problems related to utilization of non-renewable resources.
   e) Problems related to the preservation and management of land including provision for a full range of recreational uses.

2) Suggestions for a list of priorities in respect to the above based on:
   a) Immediacy of the consequences of these problems.
   b) Magnitude of the consequences of these problems (economic, etc.)
   c) Possibility of solutions and the time factor involved in their implementation.
   d) Possibility that the outcome will be irreversible.

3) Preparation of reports to the Environment Conservation Authority and eventually to the public on this census and the list of priorities. (These reports may suggest those areas in which further research is required.)

4) Advice to the Environment Conservation Authority on the establishment and operation of a service to provide information on available data, current research and involved personnel, related to the environment.

II. ORGANIZATION OF THE SCIENCE ADVISORY COMMITTEE.

1) A steering committee, composed of 5 members of the Science Advisory Committee (one the Science Advisory Committee Chairman, and four elected for a one year term) should be constituted to receive proposals from the Environment Conservation Authority regarding matters which might come to a public hearing.

This committee, in collaboration with the secretariat of the Environment Conservation Authority should collect information on the subject and, on the basis of this information, decide whether

a) the matter shall be considered immediately by the Science Advisory Committee as a whole, or

b) the matter shall be referred to an appropriate ad hoc committee (constituted by the steering committee after consultation with the Science Advisory Committee) for further collection and evaluation of data before final consideration by the Science Advisory Committee. (The ad hoc committees might, on occasion, have membership drawn from outside the Science Advisory Committee).

2) The Science Advisory Committee shall consider the report of its steering committee or the ad hoc committee, and recommend to the Environment Conservation Authority the questions to be answered and the terms of reference of any consultant's report.

3) The Science Advisory Committee shall receive from the Environment Conservation Authority any consultant's report, evaluate it and the data on which it is based and recommend to the Environment Conservation Authority any amendments or revision before such a report would be issued as a basis for public hearings. (In carrying out this function, the Science Advisory Committee would probably refer this material to its steering committee and/or an ad hoc committee and would utilize the organizational and informational services of the Secretariat).

4) The Science Advisory Committee shall be provided by the Environment Conservation Authority with the briefs and tapes of public hearings and evaluate and integrate any new scientific data or proposals with previously available material. It shall make recommendations on such matters to the Environment Conservation Authority.

5) The steering committee shall be charged with the task of organizing the collection of information for the Census of Environmental Problems and Suggesting Priorities.

APPENDIX II

The following motion was duly passed at the December 22 meeting of the Science Advisory Committee.

1. That the Environment Conservation Authority inform S.A.C. if their reports to them will be public information.
2. That the Environment Conservation Authority review the document outlining the functions and organization of S.A.C. and inform us whether the terms are acceptable.
3. That the Environment Conservation Authority determine the conditions of access of S.A.C. to confidential information and under what guidelines reports utilizing this material can be made public.
4. That the S.A.C. receive from the Environment Conservation Authority the existing or commissioned consultants' reports, including the data upon which they are based, and the terms of reference under which they were prepared.
5. The Environment Conservation Authority to take action to provide the S.A.C. with the services of at least one, full-time professional person to collect, collate and evaluate environmental information; in addition, that the Environment Conservation Authority make appropriate arrangements to provide secretarial help and a communication mechanism for the S.A.C. members.
6. That the Environment Conservation Authority provide a summary of the strip mine hearings for review by the S.A.C.

Motion carried.

APPENDIX III

RECOMMENDATIONS ON SURFACE RECLAMATION LEGISLATION IN ALBERTA

by

The Ad Hoc Committee of the Scientific Advisory Committee of the Environment
Conservation Authority, January, 1972

INTRODUCTION

The principles set out for Public Hearings, by the Department of the Environment, around which Alberta's surface reclamation legislation will be developed are commendable. It was stated as an objective in the principles that the "proposed surface reclamation legislation will strike a balance in order that optimum resource development will proceed". It follows from this statement that the proposed legislation must cover two areas.

1. It will describe procedures for determining use(s) to which any land in public ownership will be put. Since mining is just one of many possible uses of land (others may include agriculture, forestry, recreation, watershed conservation, wildlife production), the proposed legislation can be expected to either encourage or prohibit mining (including surface mining) in a particular area, depending on whether such mining would contribute to or detract from the optimum resource development*.

2. The legislation will outline the philosophy and techniques to be employed in subsequent development of any land, public or private, where surface disturbance will result. Exploration, surface mining or other activities which take place should then be done in a way that assures a continuance of optimum resource development. From details of the principles set forth in the Department of the Environment Summary, it would appear that Alberta proposes to employ techniques to insure surface reclamation

---

* Here it should be recognized that development in the case of certain resources may actually imply no development in the physical sense.

that will satisfactorily protect the environment.

Our report makes recommendations in both of these areas (ie. 1. and 2. above) of legislation. It utilizes information from the Public Hearings on the Environmental Impact of Surface Mining in Alberta, and information obtained elsewhere.

LAND USE DECISIONS

Up to the present there appears to have been little or no serious study or discussion of the alternative uses to which our public lands may be put - as least insofar as mineral development is concerned. It has been the case in the past that mineral and energy resource exploration and development have taken precedence over all other uses of land in Alberta, except in National Parks. Exceptions occurred only in those few instances where private indviduals, through long ownership, held mineral rights on deeded land. It is imperative that alternative long term development potentials of various areas be assessed in relation to any short run application for mining operations. It must be recognized that mining activity, in spite of stringent reclamation regulations and enforcement, will often preclude future developments of certain kinds. The real cost, then, of the resource exploitation is the long term economic development potential of various forms which is permanently foregone. In many cases the economic value of these potential developments, when discounted to the present at any reasonable rate of interest, generates a present value of opportunity cost which is large in relation to the present value of the external benefits generated by non-renewable resource exploitation. We are aware that the Department of Lands and Forests is currently working on a Land Use Plan for the Foothills Region of the Province. We hope that this Plan and other long term development plans for Alberta's public lands will be put before the public for discussion at the earliest possible date.

It is pertinent at this point to discuss certain aspects of "benefit-cost analyses". In general, the decision rule often used in matters of social policy analysis is that if the benefits of a proposal exceed the associated cost then that proposal is worthy of a favourable consideration. That is, a favourable benefit-cost ratio is a necessary but not sufficient condition for approval and implementation. Other development alternatives may present benefit-cost ratios which are "more favorable". Hence, decision-making criteria should focus on selecting the "best" of a number of "favourable" alternatives.

However, while benefit-cost analysis usually works quite well in policy decisions respecting the internal operations of an economic unit, when it is extended to consider the external costs and benefits generated by economic activity its usefulness (or the interpretation of its results) must become somewhat more constrained. This is because some of the benefits and most of the costs external to the economic unit, but which result directly from its activities, are more difficult to define and measure in quantitative terms. In many cases it is virtually impossible to express the external or social costs of an activity in quantitative, especially monetary, terms. Consequently, when one compares the costs and benefits, including external (or social) benefits and costs, associated with a given activity, the next result will almost always be more imprecise and uncertain than the impression generated by the presentation of a simple benefit-cost ratio. The expression of the results of such analyses in pure numbers often conveys to the uninformed reader a sense of scientific objectivity and precision which is just not warranted in the case of benefit-cost analysis as it is applied in the area of social policy analysis.

In general, the external (social) costs associated with surface disturbance arising from exploration or development of mineral or energy resources are likely to be relatively high compared to the benefits. One should realize though, that in the area of social costs one encounters two important problems: (a) many social costs are highly subjective in that different individuals or groups may agree that something "bad" will happen but attach widely different values (or social costs) to this occurrence, and (b) there are many situations in which a social cost element resulting from some activity may be either zero or extremely large depending upon subsequent events. Here is where a probability calculus must be applied in order to obtain an "expected value" coefficient. It is not difficult to see that in many cases the net result of a benefit-cost analysis will depend almost completely upon whose subjective assessments of certain social costs (and their probabilities of occurrence) are included in the benefit-cost equation.

It is impossible for us to prepare, at this time, a proper benefit-cost analysis of any proposed resource development on the public lands of Alberta. The necessary facts are just not available. However, we will attempt to collate some of the pertinent facts and point out areas that should be considered in the formulation of an "Optimal Resources Use Plan" and in the preparation of a benefit-cost analysis for any resource development proposals either received or initiated by the government prior to the formulation of such a Plan. Much of the information available to us at the present time pertains to the exploration activity and development of surface mining. This should not be interpreted as representing a bias toward or against surface mining; many of the points brought forward will be relevant in considering any resource development on previously undeveloped public lands.

In the case of any resource development the benefit side of the analysis includes revenues accruing to the Provincial Treasury in the form of royalties and taxes. It should also take into account in some way the dividends that flow to stockholders of the resource industry who are Albertans, and the employment created.

Of interest here is the brief presented by the Canada Department of the Environment which discusses the job-creating ability of coal mining (page 6). They state

> "Although employment opportunities are created by the presence of the coal mining industry and its related activities, it is not a labour intensive industry. In 1970, for example, direct employment in the industry constituted less than 1 percent of the total Alberta labour force. Introduction of an employment multiplier to determine the expansion effect does not increase the total numbers employed in other sectors of Alberta's economy significantly. A conservative estimate from several sources suggests a 1:1 ratio of direct to indirect employment within a mining community. The ratio would be slightly greater for the province as a whole."

Even though surface mining activities in the province will create an additional job for everyone employed in mining, it is still doubtful whether this can be asserted to be a direct benefit resulting from surface mining activity. Here we quote from the Slaney report

> "In general, unless the mining company proposes to use workers who would otherwise be unemployed, direct costs of labour and capital will be equal to the payments made to them. The fact that there is a certain level of unemployment at any given time does not mean that the creation of new jobs in surface coal mining is a direct benefit. We must be sure that the surface mine employs people from Alberta who actually would otherwise be unemployed and does not simply attract workers from other areas".

Every form of economic activity has an employment multiplier; and many forms of economic activity have employment multipliers which are larger than those generated by surface mining activity. Also, many forms of economic activity may result in a significantly greater expenditure of funds on domestically (provincially) produced goods and services and lend themselves more readily to the development of a broadly based service and supply sector within the province. In a period of economic expansion, such as we now seem to be entering, it is not at all clear that employment and provincial expenditures provided by surface mining activity will be in excess of those which could be generated by alternative economic activities.

Will control, curtailment, or in some cases, outright prohibition of new surface mining be likely to have significant long term effects on those employed in surface mining activity at the present time? Probably not since the type and degree of skills required by labour in surface mining operations are readily transferable into other forms of economic activity associated with economic expansion, particularly the construction sector. The American experience seems to indicate that the labour of various skills employed in surface mining operations are able to secure alternative employment without great difficulty, although in some cases this may require relocation. It is obvious that the economic and non-economic costs to those displaced by a curtailment or prohibition of surface mining operations are relatively high in the short run. However, in a democratic society with our particular economic institutions, most public policy decisions impose short run costs on the few in order to generate long run benefits for the larger community. Thus, in this particular context, the threat of surface mine operators to "leave the province" if excessive regulations and control are imposed, need not be viewed with particular alarm.

Today, more than ever before, the value of growth for its own sake is being questioned by a large and increasing segment of the populace. It is possible that employment created in Alberta which is filled by a non-Albertan may, contrary to traditional views, be a real cost to Albertans. Again using the mining industry as an example, it should be noted that miners are in very short supply in Alberta and increased mining would certainly cause an increase in immigration. Where the mining is for coal to be used for domestic power consumption, the value of the power to the Province will be taken into account as a benefit. In the case of mining for export however, it may be that no value accrues to the province from the new position, especially if the costs of education of the children, and community, medical, and housing costs are taken into account.

A benefit-cost analysis must note any direct subsidies to the resource developer, such as roads or railroads built and/or maintained with public funds. Other, less obvious subsidies are also made available, some of which could greatly outweigh the benefits received. We are relinquishing a non-renewable resource of great potential value which could possibly be used here one day to the great benefit of the province, or sold at a later date for a realistic price that also includes the social costs. We are, through the Federal Government, allowing what might be termed by some, an overly generous tax depletion allowance on coal, an allowance that has recently been increased! We, not the operators, have been shouldering the environmental costs and risks. Might there not be other forms of economic activity more beneficial to the larger community on which the subsidies could be better spent? In the case of surface mining, as the operators themselves are fond of arguing, the proportion of the total land area of this province directly affected by their activities (disregarding exploration) is very small. Similarly, the number of jobs, extent of local purchases of supplies, materials, and so forth is a relatively small proportion of the total number of jobs and volume of economic activity in the province. It may be that government concessions and subsidies could be more effectively applied in areas of development which bulk more heavily in the economic activities of the province or which have the potential to do so.

A thorough benefit-cost study will take into account that some resource developments are capital intensive; little or none of the machinery may be manufactured in Alberta or even in Canada. For example, the coking coal from the Foothills and Mountains is used elsewhere and the industry which uses it creates no local manufacturing jobs in the province. Moreover, mining associated employment here is kept to a minimum wherever possible by introducing enormous earth moving machinery and automated unit trains. The coal is shipped out of Alberta quickly by the shortest and cheapest route possible, having received no processing here other than washing. Nearly all the operations in the Foothills and Mountains are foreign owned, so that dividends leave Canada, as well as Alberta.

Each type of resource development may have certain environmental costs. With regard to coal mining, especially by surface methods, a serious concern is the possible threat to the water supplying capacity of the watersheds of Alberta's cities. Official briefs submitted by the administrations of Lethbridge and Red Deer dwell on this matter. Both cities envisage serious water shortages in the near future and are opposed to surface mining in the drainage basins from which they receive their supplies. Surface mines currently exist in both drainage basins and new ones are proposed. The brief submitted by the Federal Department of the Environment pointed out that surface mining could endanger surface water supplies. Should the livelihoods of Lethbridge, Red Deer or any other community be threatened by a decrease in the quality and/or quantity of its water supply then this is a social cost on which a value may be placed and a probability calculus applied in order to obtain an "expected value" coefficient. In the case of the livelihood of a community the social cost element will of course be very high. It is apparent that if there is a significant probability of occurrence then the expected value associated with that social cost element will also be relatively high. Should the probability assigned to the occurrence of a decrease in the quality or quantity of water be greater than zero, then the resulting expected value will be unacceptable and such activities should be prohibited. Other social cost elements may produce a lower expected value even though the probability assigned to the occurrence is appreciable. Hence "tight regulation" of the development may afford adequate protection if the populace is willing to risk the "costs" associated with failure of the protection.

It should be emphasized here that even in the case of exploration, social costs are generated, especially if the area possesses aesthetic and/or wilderness values.

A great deal of damaging exploration is being done in the Foothills and Mountains of Alberta today by trenching with bulldozer and backhoe, as well as by construction of roads built to bring in equipment. A great deal could be done in initially determining the extent of the coal resources of Alberta in the future by other techniques which do not require surface disruption (i.e. geoglocial mapping and a geophysical technique called "Induced-Potential"). The potential and reliability of Induced-Potential are just beginning to be realized and techniques for its application greatly improved (see attached letter). It may to a large degree supplant the bulldozer and backhoe in the early phases of coal exploration. Determination of the quality of deposits located by the new technique will still require excavations, but the amount of surface disturbance would be much reduced. History may well show that much of the present damage done in initial exploration was unnecessary and hasty.

It may well be advisable to delay further preliminary exploration in untouched areas until these non-destructive techniques are further refined. In fact, when the available information suggests that new areas of surface mining development in the Foothills and Mountains may be contrary to the public interest, there is little reason for the Government of Alberta to encourage development of these projects with untoward haste.

Other possible costs of resource development include loss of wildlife and fish habitat,* inspection costs, depreciation of land values in the vicinity of the operation, the possibility of diminished tourist revenue both locally and provincially, and in the case of coking coal, the loss by export of a valuable non-renewable resource.

Our mineral and energy resources are crops that can be harvested only once, they are non-renewable. Coal mining in Alberta for example, has had a short history and until very recently was done on a small scale Much larger mines than now operate here are planned and they can deplete the readily accessible portion of the resource very quickly. Little consideration seems to be given to conserving the coal resource for use at a later date.

Alberta is fortunate in that its Foothills and Mountain coal is of such fine quality. It is ideally suited for coking and steel making. It also is ideally suited for heating, because of its low sulphur content, and thereby low polluting nature. Consequently, there is a tremendous demand to purchase our Foothills and Mountain coal. Demand for this coal will fluctuate over the years, naturally, but it is likely to increase steadily through time. There is now a widespread realization that the amount of fossil hydrocarbon, including coal, is limited, and nearly all of it will be required one day. Our coal reserves are part of the heritage of our children, which we inherited from our fathers. But there are those who say that our coal is wasted and doing its owners no good until it is mined. They are right of course - providing that the owners receive fair value for it. If the owners are nearly giving it way, which they may well be at the present time, then they would be best served by leaving it in the ground.

---

* It should be recognised that while such loss is often of a temporary nature, in some instances it is permanent and irrevocable changes in wildlife populations result.

As we pointed out previously, and as noted in the Slaney Report (p. 42), a benefit-cost analysis will not make the decision as to whether social costs and risks are offset by benefits , but will only provide guidance. Once all of the measurable effects have been taken into account, the onus is still with the public administrator to judge whether or not the "benefits" outweigh other "unmeasurable" costs. To the best of our knowledge in no case of energy, mineral, or even natural resource development in Alberta has there been an independent benefit-cost analysis which could provide guidance for intelligent decisions by Government on land use. In the case of mining or forestry operations firms have made their own benefit-cost analyses, but these fail to consider social costs and risks which are charged to the public.

Thus, we propose that the Province establish a "Land Use Committee" to be charged with the responsibility of formulating an "Optimal Resource Use Plan" for all public lands under provincial control in Alberta. This formulation should not be made in haste, rather it should be a continuing process. The proposed use(s) should be placed before the public with ample time for debate and input before a final decision is made by the Committee. We recommend that the "Land Use Committee" be made up of highly competent professionals in the following disciplines:

Agronomist(s)
Biologists (Fisheries and Wildlife)
Engineers (Mining, Civil, Soils)
Forest Scientist (Management or Regeneration)
Geographers (Physical and Human)
Hydrologist (Groundwater)
Landscape Architect
Professional Forester (Management)
Recreation Planners (facility and wildland oriented)
Resource Economist(s)
Soil Scientist (Forest)

All, or certain members of the above Committee might be called upon for advice in a specific instance of proposed resource use. All should be called upon for advice in formulating an overall long term "Optimal Resource Use Plan" for public lands under provincial control. It would be expected that members be drawn from both within and outside provincial government agencies.

The Land Use Committee must develop competence in making and evaluating benefit-cost analyses, and such analyses must be made whenever resource exploration or development is proposed for public lands. This benefit-cost analysis should be prepared from the point of view of the province as a whole by an independent body. Indeed, this has also been suggested in the brief submitted to the E.C.A. by the Research Council of Alberta.

Some additional body should be given the responsiblility for the application and enforcement of the Optimal Resource Use Plan. This body should be constructed so as to integrate the functions currently dispersed among several Government departments concerned with activities having an environmental impact.

Enforcement could perhaps be accomplished most appropriately through the Provincial Department of the Environment, providing that the question of integrating dispersed responsibility could be resolved.

It is apparent that a large number of Albertans are concerned not just about "reclamation" after resource exploration or development, but are very much concerned about the land-use decisions affecting those lands which are popular for recreational uses such as fishing, hunting and hiking, or possess aesthetic or wilderness attributes. This concern is greatest with regard to the Foothill and Mountain Regions. It is probable that the word "apprehension" best describes the public mood with regard to disposition of these public lands. They recognize that past exploration and development activities have indiscriminately damaged much of the value which they placed on these "wild and scenic lands", and it would not appear that the current emphasis on "reclamation" as opposed to a comprehensive Optimal Resource Use Plan will do much to allay their fears. If we were to attempt to hazard an educated "guess" at what the majority of the people are willing to accept respecting the disposition of their undeveloped Foothill and Mountain lands with regard to the mineral and energy resources, it would probably be as follows:

> "reasonable development carried out with care
> under strict regulation on certain specified
> lands....no development on all other lands."

By accept, we mean "be reasonably satisfied with", and by "reasonable", we mean "able to be reclaimed". For a majority of citizens to be reasonably satisfied with a Optimum Resource Use Plan we think they would have to know that they had some input, or role in developing that plan. That is, they would need to know that their government listened to their opinions during the formative phases of the "Plan".

Acceptance by the government of the premise that any Optimum Resource Use Plan for public lands must involve an input by the general public would be an enlightened decision. It will of course take time, and in the interim the government will be faced with proposals from many groups to "develop" in some way many parts of the Province. Where the government receives proposals concerning exploration or development that will affect lands currently possessing considerable aesthetic, recreational, or wilderness attributes, we would recommend that consideration of the proposal be delayed until it can be seen in the light of all other land use decisions affecting the land in question and neighbouring areas as well (i.e. where does it fit in with the Optimum Resource Use Plan of the province as a whole?). Other interim proposals could be considered by a Land Use Committee similar to the one suggested earlier, the proposals being made public upon their receipt by the government. Public input could be assured via Public Hearings if necessary.

Decisions such as these will not only serve to allay public fears, but will build confidence in the public that their representatives are interested and sensitive to public needs.

RECLAMATION

Private and Public Lands

It is our opinion that regulations governing reclamation of land after surface disturbance should treat private and public lands in the same manner. This is, of course, not the case at the present time.

Reclamation of privately held land in the Province of Alberta is now under the jurisdiction of the Surface Reclamation Act and the Surface Reclamation Council. The Chairman of the Council is also the Deputy Minister of Mines and Minerals and the Act is administered by the Department of Mines and Minerals. In at least one instance in the recent past a District Court Judge has, in open court, termed both the Act and the Council to be, in effect, a joke. Put bluntly, the present Act requires the operator to do little that he does not wish to do.

Reclamation aspects of coal mining on public lands come under several Acts, notably the Mineral Surface Lease Regulations, the Right of Entry Arbitration Act, the Coal Mines Regulation Act, the Forest Protection Regulations, the Public Health Act, and the Department of the Environment Act. Even with this plethora of regulations, proper reclamation is not assured. Moreover, the large number of Acts covering coal mining on public lands is bewildering to the operator. We recommend that one Department be responsible for administration of the new regulations, and that this be the Department of the Environment.

The proposed surface reclamation legislation should cover all environmental aspects of mining regulations. This approach would appear to be endorsed by industry and they undoubtedly will find it more convenient than the present situation. As mentioned above, the new legislation must apply to all land in the province, private and public. Stipulations with regard to protection of the environment should not recognize ownership boundaries. For example, it must be recognized that a landowner does not have the right to destroy the watershed capacity of his land.

We have seen at the recent Hearings that at least one company mining by stripping methods in the Mountains on deeded land is treating the land in an enlightened manner. Canmore Mines Ltd., could have stripped certain steep slope areas under their ownership with profit under the present reclamation regulations. It has chosen not to do so because of great aesthetic damage and the possibility that adequate reclamation would not be possible. The company recognizes that the land is valuable for other uses after mining, notably recreation, and is moving forward with this fact in mind. We should ask that publicly owned lands in the Forest Reserve be treated no less well than this company treats its own lands. This treatment should be accorded to all public lands, accessible or remote.

Legislation

The Environment Conservation Authority made available a summary entitled PRINCIPLES UNDERLYING PROPOSED SURFACE RECLAMATION LEGISLATION, dated Nov. 19, 1971. We are most impressed with this summary, and feel that it should be used, with very minor change, in drafting legislation. Since we agree and support almost the entire summary we will not go through it point by point. However, we will suggest certain changes in item 4.06.

Item 4.06 Application and Approval. This item should be retitled Application and Approval or Rejection, to show clearly that rejection of the application is possible. Furthermore item 4.06 should be modified to read as follows:

4.06 The legislation would emphasize a comprehensive environmental planning process in order that optimum resource development could proceed. This will include a review of development proposals prior to three specific events, and the application can be either approved or rejected at any of these three reviews.

4.061 prior to the proposed sale or renewal by the Crown of a resource disposition in order to predetermine whether the potential environmental degradation should or should not either restrict or preclude surface mining.

4.062 prior to the issue of the necessary exploration permit in order to determine whether exploration should proceed, and if so, in order to define the terms and conditions for exploration and reclamation.

4.063 prior to surface mining in order to determine whether such mining should proceed, and if so, to determine that all factors of development and reclamation, including subsequent land use, are satisfactorily agreed to.

A citizen's complaint provision should be inserted into the regulation, to allow any citizen with knowledge that the regulation is not being enforced, to compel enforcement, via the courts if necessary. In this connection, it should be recognized that a citizen, as a part owner of public lands, should report abuses of public lands as he would abuses of his own property.

CONCLUSIONS

It is virtually impossible to define meaningful standards which would apply equally well to Prairie strip mines, Foothills strip mines and Mountain strip mines. The principles on which each individual site should be assessed are, however, common. For this reason site planning should rely on the collective judgement of an interdisciplinary regulating body (see earlier discussion re the Land Use Committee) as a more effective means of control than the rote application of regulations.

Legislation and regulations must apply to all lands within Alberta, patented or public, surveyed or unsurveyed, regardless of their geographic location, in order that preventive action be consistent. These regulations must first be preventative, and only secondarily punitive. The following are some of the regulations that we believe should apply in Alberta:

1. Prior to any exploration and/or mining development involving surface disturbance taking place, the operator must file an application containing a detailed exploration, development and reclamation plan (with timetable) with the Land Use Committee. This application should include an "Environmental Impact Statement" prepared by a qualified consultant. The Committee shall make known to the public that exploration or development activities are contemplated and shall receive from the public submissions bearing on the proposal. If deemed to be of public benefit, the government may choose to accept submissions from the public through the use of a Hearing. After reviewing the operator's proposal and any submissions from the Public, the Committee shall either (a) accept it, (b) accept it with certain modifications, or (c) reject it.
2. The Committee shall be made up of appropriate professionals (see earlier discussion) and each shall certify the part of the application on which his specialty bears.
3. Any departments or bodies required to give approval to exploratory work shall be represented on the Land Use Committee. Approval by the Land Use Committee will guarantee that the work approved can be done, to avoid causing unnecessary delay on the part of the operator.
4. The responsibility of ensuring that the accepted plan is carried out shall be placed on the operator.

5. Reclamation and revegetation should be progressive wherever feasible rather than being delayed until mining has been completed.
6. All spoil piles must be vegetated, and none will be allowed to exceed a final slope of 27° (2:1).
7. The operator shall be required to post a performance bond that will be sufficient (in the view of the Land Use Committee) to reclaim the land if he fails to do so. Upon satisfactory completion of the reclamation plan the performance bond or a portion thereof shall be returned to the operator.
8. Specifications of the kinds and numbers of roads that will be built into mining areas must be provided by the Land Use Committee. It is imperative that roads built for mining projects on public lands follow a road system well designed to meet the needs of long term management. This may imply either continued maintenance or eventual reclamation to the original natural state.
9. Unless there are good geological reasons, the coal face remaining after mining must be covered by an appropriate thickness of clean dirt fill.
10. Unless there are good geological reasons, the maximum slope of the high wall must be such that it will support vegetation after mining ceases, where vegetation originally existed.
11. No surface mining should be permitted close to a stream, adequate buffers must be left. Wherever feasible, buffers of vegetation for aesthetic purposes should be left.
12. Public Hearings must be held before a decision is made on strip mining or other resource development involving surface

disturbance within sight or sound of a National or Provincial Park, or other areas whose main value stems from their being retained in a "natural" state.

Where approval is given, every care must be taken to safeguard the values for which the Park was established and is being used.

SUMMARY

The question of alternative uses for public lands in Alberta seems never to have received serious study. In view of the fact that benefit-cost analyses will only provide guidance on the question of whether social costs and risks are offset by benefits, it is proposed that a Land Use Committee be established in Alberta to take responsibility for policy formulation on resource use and development. In addition, there is a need for another body to oversee the application of policy and enforcement of any regulations relating to environmental impact. Both these bodies should be comprised of people drawn from a variety of disciplines, and draw upon both government and non-government personnel.

There is a concern among citizens about the disposition of public lands. The current emphasis on "reclamation" as opposed to a comprehensive Optimal Resource Use Plan will do little to allay their disquiet. In the development of any such plan, there must be room for public involvement and provision for a mechanism by which opinions can be heard and considered.

We believe that regulations concerning reclamation of disturbed land should treat public and private land in a similar manner. Furthermore, in order to reduce confusion and overlap, all regulations pertaining to reclamation should be administered by the Department of the Environment.

Enlightened mining companies are already aware of the potential value of disturbed land for recreational use, following the cessation of mining activity. We should ask that all publicly owned lands be treated no less well than deeded land.

We endorse the document entitled "A Summary of Principles Underlying Proposed Surface Reclamation Legislation", with only minor amendments.

In conclusion, a set of regulations is provided drawn largely from those recommended in the Slaney Report prepared for the Environment Conservation Authority, and also from briefs presented at the Public Hearings.

APPENDIX IV

COMMENTS FROM THE SCIENCE ADVISORY COMMITTEE FOR THE ENVIRONMENT CONSERVATION AUTHORITY

SOME ECONOMIC AND SOCIAL INFLUENCES OF THE PROPOSED LAKE LOUISE DEVELOPMENT ON THE PROVINCE OF ALBERTA

With the proposal to build a thirty million dollar recreational complex at Lake Louise, the federal government and its proposed lessee, Village Lake Louise Limited, are considering a significant new type of development. The "Visitor Service Centre" proposed for Lake Louise would provide for 3,700 staff and dependents (approximately the number of permanent residents in Banff), plus approximately 8,500 to 12,000 visitors during peak periods. Because of the proposed scale of this development certain influences on the province of Alberta can be isolated.

Direct Economic Costs to the Provincial Government

Alberta will incur certain direct economic costs such as access road construction and maintenance, medical and policing services, telephone linkages, etc. regardless of whether the development is located at Lake Louise or similar development is located within the province, outside the Park.

Were the ski development sited within the province of Alberta, outside the National Park, the province would have greater cost with regard to paving and maintaining road access as well as normal townsite maintenance cost. However, the probability of paying for these costs via taxation and licencing is greatly enhanced if the development is located outside of an area under federal government control. For example, with a provincial location significant revenues would accrue directly to the province in form of royalties, licences, etc. In this instance, unlike a national park location, the bulk of taxes etc. generated by the spending would go to the province. Moreover, the province would have direct control on the development.

Balance Between Direct Economic Costs: Benefits to the Province

It is not possible to estimate a cost/revenue ratio at this time since the values of the costs and revenue variable are unknown. However, it is entirely possible that the relationships between the costs and revenues outlined above would imply that the taxpayers of Alberta will be partially subsidizing the development.

Indirect Economic Costs and Benefits to Province

Facility oriented recreation and tourism are industries having large economic and employment multipliers. The overnight visitor to staff ratio of about 4:3 indicates the extent of potential direct employment. As mentioned the development will have at least 3,700 staff when completed.

In addition, significant secondary and tertiary employment will be generated as a result of increased spending on Alberta goods and services by the development and by those who use its facilities. However, these benefits obtain for the development independent of its location and no doubt would give more revenue to the province should such a development be located in Alberta.

Tourist Centres Within the Province

Tourist centres could be located in provincial areas outside of the park but be aimed at serving areas such as Lake Louise. Canmore and Nordegg on the David Thompson Highway near the park could be mentioned in this context. These areas could also serve as summer resort centres as well as spring and fall convention centres, all of this in a manner totally consistent with National Park Policy.

Given current estimates of the demand for this type of facility, development at Lake Louise within the park would both suppress and delay similar development on provincial lands outside the park. This is a development option which the provincial government may wish to retain in order to effectively control and promote the future of this sector of economic development in Alberta; such opportunity would be lost to the province for many years if the development takes place at Lake Louise. This is a loss of major economic opportunity and of an important instrument for provincial development policy.

Social Costs and Benefits

In addition to economic costs and benefits there are of course social costs and benefits which must be taken into account. Unfortunately, no adequate study of the ecological impact of this development has been presented and probably never was made. There may well be certain disamenities (i.e. social costs) associated with a development of this magnitude inside of a national park. For example, Banff National Park contains over 3,000 square miles, an area large enough to preserve grizzly bear and wolf populations; but only if major development does not impact on these species. These and other animals and plants, and their associated environment are a major resource to the people of Alberta and all Canadians. Outside the parks within the province, these and other species must be controlled and in many cases eliminated because of conflict with human economic activity. The Village Lake Louise Development within Banff National Park is of such a magnitude that it might cause a further retreat of the grizzly bear and lessen chances of re-introducing wolves in this and adjacent areas. In our mind, these would be very important social costs. As well, the development at Lake Louise, with its sphere of human impact during the summer, will significantly alter the natural environment, thus taking an important amenity (social benefit) away from Albertans and other Canadians. The same scale of development located at a suitable site outside of Banff Park would increase the diversity and options available to all persons and greatly lessen the social costs discussed above.

There are other social cost elements that can easily be isolated. These will include impact on water quality of the Bow River from sewage generated by the Lake Louise development, location of gravel borrow pits within the National Park, damage to alpine meadows from excessive trampling, etc. These disamenities are common to any development but are amplified in the context of a national park. This is then in reality a loss of diversity and heritage and will be a social cost shared by all Canadians. To justify this loss we should be able to attribute unique benefits to development situated at Lake Louise. What such benefits will accrue? Would it provide better access to the natural beauty and unspoiled environment of Lake Louise? In fact, such access would be denied everyone for the natural beauty and unspoiled environment of Lake Louise would no longer exist. Furthermore, special access privileges would be provided only to those who could afford them. A visitors'centre outside the park would, in contrast, provide equal access for everyone to the unspoiled, and perhaps restored environment if the present Chateau is removed from the Lake area.

We can thus ask, could these same benefits (and/or other benefits) be generated elsewhere within the province without incurring similar social cost or losses. If the answer to this question is yes, then we believe that it behoves the Province of Alberta to promote tourism, townsite development, summer resorts and downhill skiing within the province and outside of the national parks. Some of these should be located so as to provide services for park visitors.

If developments were outside of the park and free from park restrictions,then also a greater number of ancillary facilities could be developed as well to provide multi-use recreational areas.

These points rest on two assumptions: (1) that potential high quality ski areas exist in the province along the Great Divide or elsewhere, and (2) that the town of Canmore and Nordegg or other areas could be developed as tourist centres. In our opinion, the provincial government should institute surveys to ascertain the position in these matters as soon as possible.

APPENDIX V

June 7th, 1972

TO: Mr. G.W. Govier, Director
Energy Resources Conservation Board
603 - 6th Avenue, S.W.
Calgary, Alberta.

COPIES SENT TO:

The Honourable Peter Lougheed
Premier of the Province of Alberta

The Honourable Don Getty
Minister of Federal and Intergovernmental Affairs

The Honourable William Yurko
Minister of the Environment

Dear Sirs:

Environmental concerns should be given due attention in considering field prices for natural gas in Alberta. We are therefore writing to call the attention of the Energy Resources Conservation Board to some of these concerns. The Board no doubt realizes that Alberta's reserves of natural gas are limited and that the amount of reserves which are being proved each year is diminishing and may be now or in the near future less than the amount of gas being extracted. There must also be full realization that processed natural gas is a low-pollution energy source for space heating, electricity generation and other purposes since it produces less SO_2 and less particulates than coal when burned. New regulations for air pollution control in the U.S.A. and Canada will force power generating stations and other large industrial users to switch from coal to natural gas or to introduce other procedures to diminish air pollution. This must result in an increased demand for natural gas at least during the period when the technology for pollution control with coal or nuclear fuel is being developed: i.e. probably for the next 20 years at a minimum.

Consideration with respect to gas pricing

Social Costs

Adequate account of environmental or social costs associated with its production must be taken in assessing the price of natural gas. It is not clear whether the externalities[1] in the prairie region associated with the exploration and extraction activities (extraction to wellhead) are large enough to be incorporated as costs in determining the price structure. If we look at each stage of the production process for natural gas, exploration and extractive activities are damaging in an environmental sense in sensitive areas such as perma-frost, forested foothills or alpine regions. These social costs should be incorporated in the price structure when natural gas is obtained from sensitive areas where significant environmental damage occurs in exploration.

[1] Many activities have side effects which are external to the activity responsible and these effects which carry costs are referred to as "externalities" and when the costs of these side effects are borne by society generally they are also referred to as "social costs".

The processes involved in cleaning natural gas and producing it in a low-pollution state, of course present significant externalities. Natural gas plants may discharge pollutants into the atmosphere and may contribute to the pollution of water, air and soil. This may occur not only through acute upsets of operation, but as a result of continuous emission of very low levels of pollutants. In response to public concern and pressure (see for example, Environmental Pollution in the Drywood Creek Region of Southern Alberta, 1971. A brief from the Department of Geography at the University of Alberta to the Department of the Environment, Alberta.) industry has become very active in carrying out studies of the effects of its operations on the environment. The gas plant operators in the Edson, Whitecourt, Valleyview area are now assembling data on the environment in an area approximately 30 x 100 miles within which their plants are located with the view of minimizing long-term damage. Further, an individual oil company has commenced a study of the effect of its operations on soil, vegetation and livestock in the area surrounding one of its major gas processing plants. This study is expected to cost in excess of $250,000 over the next two years. We believe that these examples indicate that there is sufficient evidence of the social costs, to convince industry that determining these costs is expensive but practical, and where these costs are associated with the production of gas, they should be included in the formal cost structure and reflected in the price.

The environmental costs of a distribution system for natural gas should be included in the present pricing structure in the case of new pipelines to be constructed or where expansion of existing pipelines occurs.

The consumption of natural gas, both industrially and residentially, is not a pollution-free process. Nitrogen oxides, carbon monoxide, ice fog in winter as well as CO_2 and H_2O are produced. As such, it also introduces an externality or social cost element which should be estimated and reflected in the pricing structure. It is suggested that these costs be compared to those for the consumption of other energy resources.

Industry is the most likely target because it is the most visible and appears to be the largest consumer, but the average homeowner also contributes to pollution by heating his home with natural gas. Both homeowner and industrialist should pay a price sufficient to cover any social costs of their emissions.

It is probable that there will be increased social costs or externalities associated with the increased consumption of high-pollution energy resources such as coal or nuclear fuel at that time in the future when natural gas reserves have been depleted. Accordingly, these social costs should be estimated, discounted to the present and included in the price of natural gas charged at present. Another temporary alternative for supply of energy to Alberta would be the import of natural gas from the North Slope of the Arctic. However, it is clear that this gas would be significantly more costly because of the increased expenses in production related to exploration, transmission and payment to avoid damage to the Arctic environment. In effect, Albertans will be asked to pay these extra costs for customers to whom it is currently exporting its natural gas since without such an export these customers would have to pay the extra costs associated with production and transmission for Arctic gas.

This increase in the price of natural gas could accomplish at least two things. First, it might reduce the demand for it and thus prolong the usefulness of existing reserves. Second, to the extent that an appropriate transfer mechanism such as the present royalty structure exists, there could be increased revenue flowing to the provincial government. The increased governmental revenues thus generated could then be used to finance research into low-pollution substitutes for natural gas in the future and/or could be set aside in a "sinking fund" in order to cover the social costs of using high-pollution energy resources in the future. It is uncertain how large these future social costs are likely to be.

Widely different assumptions about the future pace and direction of technological change are involved in deciding whether the cost of these externalities will be very large or not. In any case a means of including future social costs should be agreed and incorporated into the pricing arrangements. It is evident that it is best to err on the "high" side in assessing the cost of these externalities since experience indicates that we always tend to dismiss or seriously underestimate these costs.

Up to now we have presented arguments for an increase in natural gas prices sufficient to take account of social costs including provision for the future social costs of converting to a more polluting energy source. In effect this would act to conserve natural gas as envisaged in policy A.

A. It is better to conserve our low-polluting energy resources for consumption in the future by regulating current production because levels of both population and economic activity are relatively low and may permit us to tolerate more pollution now.

However, an alternative policy can be envisaged.

B. As a response to current concerns about pollution it may be appropriate to encourage greater current use of low polluting energy sources.

Either of these policies may be implemented through the price mechanism. Policy A could be achieved through an increase in the current wellhead price of natural gas relative to other fuels, Policy B by a decrease. Other economic measures could also be applied to achieve the same objectives, e.g. Policy A could be implemented by imposition of export quotas, duties or even prohibition of gas export or a change in relative tax rates on different forms of fuel. The recent proposal to tax reserves, if applied to natural gas reserves, would in effect promote Policy B. However, it is difficult to see how present or future social costs could be provided for under Policy B.

The present royalty structure obviously provides an important source of revenue to the Province and this would have a bearing on decisions taken on environmental grounds with respect to use or preservation of gas. It is essential to recognise that due to more strict regulation of air pollutant concentrations in the U.S.A. there is expected to be an increasing demand for low sulfur fuels, particularly natural gas.

Price Mechanisms

If we are concerned with conserving reserves of natural gas in order to obtain longer use of low-polluting energy resources, Albertans may be in a position to practice what economists refer to as third-degree price discrimination. By this is meant charging a different price for the same commodity to different consumers; indeed, this is a practice followed by the natural gas companies within the province of Alberta, as seen in their differential rate structure for industry and residential use. Alberta, as producer, may be able to discriminate against importers, e.g., other Canadian provinces and, more importantly, U.S. consumers, by fixing royalties which result in a significantly higher price to them than to residents of the province. This mechanism, by raising the price of natural gas to outsiders, might reduce their demand for our gas, causing a shift to other energy resources. It also might increase provincial income from the sale of natural gas. Discrimination in pricing is justified by reference to externalities mentioned above; there is no reason why Albertans should pay for the preservation of the environment in the U.S. This price discrimination would help to conserve the reserves of natural gas and at the same time permit the government to continue to make this resource available to the people of Alberta at a relatively low price. In terms of secondary industry and future exports this factor could make a considerable difference to the competitiveness of Alberta's manufacturers. Also, in this context, it is possible to discriminate between users in the sense that one may charge a low price to those who use the product in a non-polluting process and a somewhat higher price to those who use the product as an input to a process which is more highly polluting.

Conclusions

In general, this committee favours Policy A, i.e. adoption of a policy taking social costs into account and leading to conservation of natural gas at the present time. It also favours the introduction of differential rate structures to ensure that Canadians benefit preferentially from Canadian natural resources. We favour these policies because of the advantages that may accrue to Alberta from regulating the consumption of a low-cost, low pollution energy source and keeping it available to Alberta citizens and industries. This will favour the development of secondary industries by providing a low-cost energy source and/or a base for the development of a chemical synthetic industry, if these are provincial goals.

Yours sincerely,

E. E. Daniel

E.E. Daniel, Ph.D., Chairman
Science Advisory Committee of the
Environment Conservation Authority
c/o Department of Pharmacology

EED:mmz

Printed on recycled paper